

Appl. No. 10/809,356
Amendment dated: September 9, 2005
Reply to OA of: June 13, 2005

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1 (currently amended). A method for preparing a fuel cell composite bipolar plate, which comprises:

a) compounding a mixture comprising a graphite powder, and a vinyl ester resin, a mold releasing agent in an amount of 1-10%, based on the weight of said vinyl ester resin, and a solvent in an amount of 10-35%, based on the weight of said vinyl ester resin to form a homogeneous bulk molding compound material, wherein said material comprises 60 to 80 wt% of said graphite powder, based on the weight of said material;

b) molding the material from step a) to form a bipolar plate having a desired shape at 80-200°C and 500-4000 psi;

wherein particles of said graphite powder have a size of 10-80 mesh[[.]], less than 10 wt% of the particles of the graphite powder are larger than 40 mesh, and the remaining particles of the graphite powder have a size of 40-80 mesh;

wherein said vinyl ester is selected from the group consisting of bisphenol-A epoxy-based methacrylate, bisphenol-A epoxy-based acrylate, tetrabromo bisphenol-A epoxy-based methacrylate, and phenol-novolac epoxy-based methacrylate.

Claim 2(canceled).

3(original). The method as claimed in Claim 1, wherein said mixture in step (a) further comprises a free radical initiator in an amount of 1-10% based on the weight of said vinyl ester resin.

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4(original). The method as claimed in Claim 3, wherein said free radical initiator is selected from the group consisting of peroxide, hydroperoxide, azonitrile, redox systems, persulfates, and perbenzoates.

5(original). The method as claimed in Claim 4, wherein said free radical initiator is t-butyl peroxybenzoate.

Claim 6(canceled).

7(currently amended). The method as claimed in Claim ~~[[6]]~~1, wherein said mold releasing agent is wax or metal stearate.

8(original). The method as claimed in Claim 7, wherein said mold releasing agent is metal stearate.

9(original). The method as claimed in Claim 1, wherein said mixture in step a) further comprises a low shrinking agent in an amount of 5-20%, based on the weight of said vinyl ester resin.

10(original). The method as claimed in Claim 9, wherein said low shrinking agent is selected from the group consisting of styrene-monomer-diluted polystyrene resin, copolymer of styrene and acrylic acid, poly(vinyl acetate), copolymer of vinyl acetate and acrylic acid, copolymer of vinyl acetate and itaconic acid, and terpolymer of vinyl acetate, acrylic acid and itaconic acid.

11(original). The method as claimed in Claim 10, wherein said low shrinking agent is styrene-monomer-diluted polystyrene resin.

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12(original). The method as claimed in Claim 1, wherein said mixture in step a) further comprises a tackifier in an amount of 1-10%, based on the weight of said vinyl ester resin.

13(original). The method as claimed in Claim 12, wherein said tackifier is selected from the group consisting of alkaline earth metal oxides, alkaline earth metal hydroxides, carbodiimide, aziridines, and polyisocyanate.

14(original). The method as claimed in Claim 13, wherein said tackifier is calcium oxide or magnesium oxide.

Claim 15(canceled).

16(currently amended). The method as claimed in Claim ~~[[15]]~~1, wherein said solvent is selected from the group consisting of styrene monomer, alpha-methyl styrene monomer, chloro-styrene monomer, vinyl toluene monomer, divinyl toluene monomer, diallylphthalate monomer, and methyl methacrylate monomer.

17(original). The method as claimed in Claim 16, wherein said solvent is styrene monomer.

Claim 18(canceled).

19(original). The method as claimed in Claim 1, wherein said vinyl ester resin has a molecular weight of 500-10000.

20(currently amended). The method as claimed in Claim ~~[[18]]~~1, wherein said vinyl ester resin is phenol-novolac epoxy-based methacrylate.